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ABSTRACT

The contributions and limitations of computer technology in the presentation of grammar drills, particularly in a second language, are examined by comparing and contrasting the new technology with traditional textbook instruction. It is noted that, in many ways, computer-assisted language learning (CALL) is a derivative form of traditional language teaching, but that CALL has some specific advantages in seven areas: organization of materials; display of items; volume of material and random presentation; feedback, scoring and record-keeping; focused tutorial assistance; graphics and animation; and cognitive direction. Each of these areas is discussed briefly, and some additional pedagogical by-products discovered by the author are noted, including allowing student control; audio-cuing, and recording and storage of student responses; the computer's literal approach to checking answers; minimal need for student writing; and ability to focus learner attention on a specific area of the screen. Some positive comments of students surveyed concerning computerized grammar drills are presented. A list of foreign language software developed at the University of Wollongong and a number of computer screens are appended. (MSE)

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Grammar Drills: What CALL Can and Cannot Do.

Brian McCarthy
University of Wollongong

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Grammar Drills: What CALL can and cannot do.

Brian McCarthy, Department of Modern Languages, University of Wollongong

INTRODUCTION

By grammar drills we mean structured activities designed to reinforce patterns and principles of language usage which have previously been explained and rehearsed. The traditional medium of presentation of such drills has been the textbook, and, since the sixties, the textbook accompanied by audio cassettes. In this paper the contribution and the limitations of computers in presenting grammar drills will be explored largely by comparing and contrasting the new idiom with the established one on the basis of almost 5 years' experience gained by the author and his colleague Ray Stace in the course of developing a comprehensive set of Hypercard-based French grammar revision exercises at the University of Wollongong.

It is hardly surprising that there are many similarities between the two idioms. Grammar textbooks have been around for centuries. During this time they have evolved and been refined in response to varying pedagogical priorities and learner needs. CALL is in many ways a derivative form. It is technology rather than a methodology, and its function is to enhance rather than to replace more traditional media. Having all foreign language instruction performed via computer (even using multi-media capabilities) would be unsatisfactory in the same way as it would be to restrict the teacher to any other single medium, be it talk, chalk, video, print, pictures or audio cassette.

It is easy for teachers who have become aware of the virtually endless ways in which computers can enhance language learning to forget the areas in which books have obvious and very real advantages: they are familiar, affordable, portable, robust. You don't have to plug them in, turn them on, or wait for their

system to boot up, and they seldom if ever crash. Just because computers have given a new dimension to the concept of multi-media does not mean that books are mono-medium. The manipulation of printed text, colour, graphics, layout and design have allowed books of one type or another to serve as the sole guide and vehicle for extremely diverse teaching approaches, and as an indispensable component of many others, including CALL.

The preceding remarks may not sound like the words of a CALL devotee. But they are. This devotee is both committed and enthusiastic, but he is also sober and realistic. To think about CALL grammar drills, or any other application of computers to language learning, other than against such a backdrop is to risk spending much time and effort on the ephemeral or the irrelevant. Among the first rules of software design are the principles of exploiting the computer for what it is good at, being frank in assessing its merits and weaknesses compared to other media and approaches, and integrating CALL materials into the teaching program only where they are most appropriate.

SO WHAT CAN COMPUTERS BRING TO GRAMMAR DRILLS?

Computers, like books, are not particularly good at spontaneous, intuitive, warm, human, flexible, genuinely communicative two-way spoken interaction. In spending time on grammar drills, however, few teachers or their students imagine that they are doing it for its immediate functional communicative value or to replace any of the large array of interactive speaking activities performed in other phases of the learning process. The purpose of grammar drills is to set in place through structured, concentrated, repetitive activities key elements of morphology or syntax. True foreign language learners in an environment such as the one in which most Australian learners operate do not have sufficient opportunity to acquire these elements through observation, inference or repeated use in authentic need-driven communication with native speakers. We will deal with the contribution that can be made by the computer under seven main categories: organisation of material;

display of items; volume of material and random presentation; feedback, scoring and record-keeping; focused tutorial assistance; graphics and animation; and cognitive direction. Where appropriate, illustration is provided from some of the modules developed at the University of Wollongong. A complete list of this software is provided in Appendix 1.

ORGANISATION OF MATERIAL

It is possible to organise material on a computer in exactly the same way as in a textbook. This would involve typing in the text using any word-processing package, and allowing users to scroll through it in much the same way as they would leaf through a book. And the end-result would be far less satisfactory: the user would not be able to see even the full contents page on the screen at one time, let alone flip comfortably back and forth between sections. Why have inert information presented on a small screen and disappearing from sight completely when you move so much as half a page away, when you could have it in a book that you can hold, flip through, put a bookmark in, and whose physical shape is very tangibly present at all times allowing you to see and feel your way around it? In short, a computer dressed up as a textbook is no match for the real thing.

Because of its radically different nature, the medium of the computer requires a whole array of different conventions for presenting information. However, when information is dealt with according to the inherent qualities of electronic media rather than those of print, a new set of conventions emerges and, along with it, fresh combinations of information and new dimensions of interactivity between the learner and the subject matter.

One of the fundamental areas in which computer and book differ is that of the organisation of information. Books are strictly and inescapably linear. With computers, only a small amount of information is visible on the screen at one time, yet they have the potential to store vast quantities of data. Consequently

stratification, branching and looping have emerged quite naturally as the most appropriate means of facilitating the user's navigation through the material. As the computer screen is not three-dimensional like a book, an alternative has to be found to the 'depth' factor which enables the reader of a book to say such things as: "the bit I want is about three-quarters of the way through"; or "I'll just flip back to the table of contents"; or "the exercises always come after the grammar explanations and the examples".

The need to find an alternative in fact forces the software designer to be conscious of learner needs at all times. The electronic counterpart of a grammar book's palpability and dimension of depth commonly takes the form of a section of the screen being dedicated to navigational options. This benefits the student in that the designer is forced to anticipate the learner's needs and potential difficulties at every moment of an activity. In the example shown in Fig. 1, a typical work screen from the exercise on French pronoun object form and position, this anticipation takes the form of provision for access at any time to relevant grammar notes [Grammaire; Table des Pronoms]; operational instructions on the exercise, accompanied by numerous animated examples [Aide]; a reference card on the keystrokes for any accented characters students may be required to type [Accents]; "linear" information on where they are up to in the exercise; options to check or to erase the answer; and, most importantly, the possibility of bailing out of the exercise altogether.

Unlike a textbook, the realisation of any of these operations in a computer activity requires only a click on the appropriate spot on the screen. It is instantaneous, and returning to the exact spot in the exercise is equally simple and prompt.

Similar comprehensive anticipation of user needs, clear visibility of options and instantaneous access to them is available at other strata of the activity such as the index card or the results screen.

DISPLAY OF ITEMS

- It is not only the lack of a visible third dimension that has a bearing on the configuration of information in CALL activities. The limited space available in the two remaining dimensions is further restricted by the multiple functions this space must serve. In the case of grammar drills, this effectively rules out the display of more than one item at a time. As it turns out, this 'restriction' actually enhances the activity by focusing attention only on the item at hand, allowing the student to approach each item as a fresh task, minimising the capacity of previous items to reinforce wrong principles or to encourage students to infer answers by pattern-matching rather than focus on meaning. It also means that a considerably larger font size can be used, improving legibility and reducing eye strain.

- Students can erase and re-commence an incorrect answer without 'messing up the page'; they can see how an answer looks without being committed to it (no one will know if they got it wrong); they can come back one hour, one day or one month later and re-do the item much more freshly than if they were going back to it in a pre-used page in a textbook.
- If a student's final answer is incorrect, the ephemeral nature of electronic text is such as to leave no visible trace of the error, either as a reinforcement of bad habits or as an abiding monument to ineptitude and a source of embarrassment.

VOLUME OF MATERIAL AND RANDOM PRESENTATION

The computer's capacity to file away huge volumes of readily retrievable data in a small physical space makes the legendary skill of inscribing the Lord's Prayer on the head of a pin seem clumsy and dated. Being able to store such large quantities of data inconspicuously means that there is virtually no upper limit to the number of

items in any activity. Our French Pronoun Objects module, for example, contains more than 6500 items, all of which are called on in the revision test, with individual exercises drawing on wells containing between 168 and 1592 items; and the Reported Speech module, with 18 individual exercises of approximately 400 items draws on some 8500 in the revision tests.

The accumulation of large banks of items is not a manifestation of unbridled linguistic avarice. There are sound pedagogical reasons for it. Large wells of items coupled with the computer's capacity to present them in random order make it possible for students to return fresh to the 'same' activity time and time again. They will seldom see the same question twice, it is most unlikely that they will ever be confronted with the same set of questions, and the chances of their ever having the same set of ten or twenty questions in the same sequence are infinitesimally small. This ensures that students master the pattern rather than the individual item. It also enables them to test themselves against themselves, monitor their own progress, and improve their performance without 'wearing the activity out'.

The computer format has added a new dimension to the genre of grammar drills. The hoarding of thousands upon thousands of items for a single grammar activity in printed or hand-written form conjures up images of dusty filing cabinets in the cluttered offices of dedicated but eccentric academics. At issue is not the inherent value of the items, but how, realistically, to make use of them. Such accumulation has to date been something of an innocent and altruistic exercise in pedagogical futility. Keeping track of the exercises, accessing them at the appropriate moment, organising them, and reproducing them promptly for use by students rapidly becomes an administrative nightmare. The volumes of paper required to store and to reproduce them would be grounds for a minor environmental scandal, and, because the same restrictions of space, linearity and re-usability apply to the medium regardless of sophistication of presentation, the chances of finding anyone willing to take on their publication as a commercial venture are very remote.

When presented randomly by a computer, however, the very qualities which made these exercises seem tedious and unwieldy now make them stimulating and attractive. Students can call up as few or as many questions as they want or need; the more items in the well, the greater the chance of each work session being fresh and challenging. Full integration of new items and modification and updating of existing items is an easily-achievable, environmentally friendly operation.

FEEDBACK, SCORING AND RECORD-KEEPING

Few people dispute the value of some form of grammar drilling when a student is operating in a truly foreign-language-learning environment - i.e. when he or she must find a substitute for the constant auditory reinforcement and the normative influence provided by the community of speakers surrounding the learner who has the privilege of studying or of living and working in a country in which the target language is spoken. And there is no doubt that the best computer feedback is inferior to the best feedback provided by a competent language teacher. Yet grammar drills seem to provide the most abiding and least happy classroom memories for the majority of erstwhile foreign language learners and teachers who recall the futility of nothing-but-grammar lessons; the tedium of turn-by-turn answering around a mixed-ability class of 30; the false impression of group mastery fostered by the class-chorus response; the loss of student interest in and sense of ownership of answers during the time that elapses between the submission of a written exercise and its return after correction; the occasional inadequacy of written corrections by the teacher and the considerably greater inadequacy of corrections by fellow-students on those occasions when teachers opted to save time by having students correct each other's work *en masse* in the classroom; the large investment of teacher time for a relatively small return in terms of learning; the ease with which the use of lesson time can overbalance in the direction of drilling and testing instead of being used to build functional

communication and comprehension skills or to provide careful explanations of linguistic notions.

When it comes to providing feedback, computers are genuinely interactive where textbooks are not. Textbooks can provide answers, but they do not tell students whether they are right or wrong. Students must deduce this for themselves by comparing their answers with the ones supplied. There is no way of controlling whether they can do this before or after attempting to answer. And as the page of the text or workbook goes no further in absorbing the student's answer than to receive its physical imprint on the page, it is not capable of letting the student know so much as whether his or her pencil is blunt, let alone of analysing the nature of errors and providing relevant comments on them.

Computers make it possible to incorporate a variety of accounting procedures. These include scoring (both progress and final scores); indicating how many questions have been attempted, how many remain, and the score the student is on target for at the present rate; storing scores for subsequent consultation by a teacher; creating a "misses" file available to students on completion of the exercise and allowing them to compare all their incorrect responses against the anticipated responses; controlling the degree of difficulty or the nature of the next item to be presented, in the light of the pattern of errors made by the individual student; gathering analytical data on individual items or categories of items posing problems for learners.

Once appropriate feedback is incorporated into a piece of software, there is virtually no limit to the number of times a student can benefit from it, or to the patience, promptness, detail, impartiality and confidentiality with which it is delivered. The correction process does not require teacher involvement at any stage, and student results 'stay put' in a private file on the computer accessible only to the teacher.

In multiple-choice activities students recognise and activate responses rather than create them, but this restriction is offset by the fact that detailed, relevant feedback can be provided immediately and automatically for every possible choice.

The longer the string of text to be entered as an answer, the more difficult it is to incorporate programmed checking, as prediction of all the permutations and combinations of grammar and typing errors becomes virtually impossible, and the more variants against which an answer is checked, the slower the checking process. Once the bulk of an answer is essentially correct, however, it is possible to give users consistent and constructive feedback for predictable errors associated with the grammatical core of the exercise.

FOCUSED TUTORIAL ASSISTANCE

For grammar exercises, one of the most striking outcomes of the new configurations of information imposed or fostered by the medium of the computer is the opportunity for fresh associations between grammar presentation and revision drills. We have already referred to permanent and instant access to relevant grammar notes and to the possibility of automatically taking students to the section of the notes most appropriate to the facet of the problem they are currently working on. Of greater interest is the potential to use click-steps, automated sequences and animation to combine explanations of how to do an exercise with a rehearsal of the fundamental concepts and processes of grammar in action, allowing students to access guided, visually stimulating, logically structured explanations of why and how they are manipulating the language.

It is perhaps appropriate to mention at this point that there can be few better illustrations of the gap between the conventions of expression for straight print media and those applying to CALL software than the difficulties one encounters in attempting to give a concise, clear and complete explanation of an elaborate computer process in the space of one or two paragraphs of a journal article. Words

can provide only a dim and partial reflection of pictures and operations. Figures 2, 3 and 4 are presented in an attempt to illustrate the intersection of drill and mini-tutorial referred to above. In each case the example provided is one of many. A large range of such examples is provided in each module to allow students to explore variants of the principle and different levels of complexity. Fig. 2(a-d) shows the operation of Example 5 for French Pronoun Object Order in the passé composé. Different sets of examples are provided for the present tense and the imperative. Fig. 3 (a-c) shows a 'Help' tutorial sequences from one of the French Relative Pronoun Idea Links activities, and Fig. 4 shows two key screens from one of the French Relative Pronoun Press Clips activities. Animation coupled with well-chosen examples and carefully sequenced instructions and images makes it possible for students to have repeated access to an electronic encapsulation of well-planned 'blackboard work', and to have the power to regulate the pace at which it is presented.

GRAPHICS AND ANIMATION

The idea of using graphics in conjunction with grammar-oriented activities is hardly novel. Their greatest value is that they provide a means of by-passing the printed text and of supplying the sort of direct link between the 'signified' and the spoken word typical of real-world communication situations. This has been readily recognised since the era of structuro-global audio-visual methodology, where audio recordings were commonly accompanied by huge banks of slide transparencies. Cue cards, posters and flannelgraphs have proved to be similarly beneficial, although their use has been more 'localised' in the sense that they are clearly of more value for some grammar points than others. Simple logistic considerations are among the main reasons why graphics have often been overlooked or avoided.

The number of ways in which graphics, animation and video images can be incorporated into CALL grammar activities is limited only by the imagination and resources of the individual teacher. Whatever pedagogical approach graphics may be supporting, any use of them in the computer medium has a number of useful un-book-like characteristics: they occupy very little real space (1000 pictures do not take up much more room than 10); you don't have to handle them or store them in cupboards or cabinets; switching between images and presenting them in varied sequences does not require juggling, hand-eye co-ordination, spare hands, flicking back and forth between pages or switching between resource books; video clips, line drawings, slides and maps are all reduced to a common medium, they can all be managed in the same way and used interchangeably.

The following are three very simple ways in which the author has used the computer's capacity to integrate graphics into grammar drills. Fig. 5 shows a very simple use of graphics as cues for generating comparative sentences.

Fig. 6 is one screen from a recently developed module on Shopping. Within this activity students are encouraged to manipulate over 60 quantity expressions (numbers, weights, volumes, and format or package types - *une boîte de, une bouteille, un bocal de, 2 paquets de, 6 tranches de, une dose de, 3 barres de...*) in conjunction with over 260 products. The visual and audio components have a high priority, but always have available at least optional reinforcement in the written code. In this module the functional aspect of requesting, and the notions of goods, quantities and prices provide the primary focus, with the grammar of quantity expressions being rehearsed implicitly rather than explicitly.

In the case of the module on reporting speech (Fig. 7) - a suite of exercises containing over 8000 items - the incorporation of graphics endows the interlocutors in each item with an image, a physical presence, and with recognisable features of sex and age. But perhaps the most significant contribution they make to the grammatical power of the activity is that they provide an opportunity to elicit, simply

and naturally, either nouns (proper and common) or pronouns as subjects or objects in the reported speech.

The potential for use of video or animation in drilling notions (e.g. prepositions, directions) and functions (e.g. greetings, refusals, conversation terminators) is virtually endless. So too is the potential of sound, although, as with any resource, its use will be more appropriate in some situations than others. Sound would be less likely to enhance a drill on adjective form than it would an activity on reported speech, for example. It should also be remembered that storage space for sound remains a problem, particularly if an exercise is to be truly interactive and require the computer to store large quantities of recorded student voice as well as flexible, comprehensive banks of master audio data.

COGNITIVE DIRECTION

Some of the advantages of stepping through information one screen-load at a time have already been noted. These include clearer display and more focus on the item at hand, and compulsory clarity of thinking on the part of the teacher-designer in presenting explanations. The step-by-step technique can also be built into the answering process as a means of ensuring that students not only get the right answer, but that they get to it by the right path. Figs 8 and 9 show two simple ways in which a degree of control can be exercised over students' thinking as they move towards the answer: it is akin to requiring students attempting a maths problem to show their working-out.

Fig. 8 is an illustration from the Adjective Review exercise. This is one of 9 exercises in the Adjectives module. The other 8 do not involve cognitive tracking. Each answer in this exercise comprises three steps: identifying of the word(s) the adjective describes, indicating the number and gender, then typing in the correct form of the adjective.

A similar technique is used in the Passé Composé activity on non-reflexive verbs.

conjugated with *être* (Fig. 9), where students must correctly identify the number and gender of the subject before typing the verb form. Here again it is recognised that incorporating this type of compulsory stepping in a systematic way is neither appropriate nor desirable. It could in fact become extremely tedious and demotivating. It was not considered worthwhile or necessary in any of the other 15 exercises in the Passé Composé module.

THE LIST GOES ON...

Many other 'by-products' and pedagogical 'tricks' have emerged in the course of designing our set of revision modules for basic French grammar. These include:

- Allowing students to choose whether they will be in control of moving on to the next item (i.e. whether they wish to have time to study their response and compare it to the correct answer supplied by the computer), or whether to allow the computer to present the next item automatically.
- Audio-cuing, and recording and storage of student responses (within memory and disk space limitations).
- The computer's very literal approach to checking answers is the source of seemingly endless debate between those who believe that accuracy in every respect is a thing to be encouraged, and those who consider preoccupation with punctuation, spacing and exact adherence to an answer pattern to be irritating, pedantic and proof of small-mindedness. Few students, however, complain when they realise after a year or so that they have acquired a good degree of computer literacy and learned how to type accurately. And few teachers resent the fact that typed answers cause many age-old student ploys to evaporate as if by magic. Such ruses as the indeterminate hand-written vowel which could be a, e, i or o ; the cunningly disguised accent that could be read as an acute, a grave or a circumflex; the dot that may or may not be a hyphen or a cedilla; the little gap between adjoining letters that may or may not indicate that *quel que* is two

words.

- It is often possible to eliminate the need for typing altogether by providing menus in which students need do no more than click to activate the answer they consider correct. This is one way of minimising the disruptive effect of writing on thought.
- The computer can create, move or remove the user's focus of attention on a particular spot in the body of text on the screen.

CONCLUSION

In many countries, as a consequence of the increasing costs associated with education, there is considerable pressure to restructure, to examine new teaching methods, and to introduce economies of scale. The use of new technologies is seen by many as one way of reducing staff-student ratios. But the idea of computers taking debutant foreign language learners and miraculously transforming them into fluent speakers with near-native proficiency is as ludicrous as it is repugnant. In this paper we have demonstrated that, at least in the narrow area of drilling and reinforcing core grammar, computer technology has a great deal to offer in meeting the needs of individual students. The other side of the coin, however, is that the medium makes great demands on the teacher in designing software that anticipates student needs and responses, organising linguistic data and managing the interface between the learner and the machine.

Successful use of computers for grammar review is dependent on the existence of robust, linguistically sound software that is fully sensitive to learner needs, that exploits the strengths of the computer while acknowledging the valuable and ongoing contribution of other media and approaches, and that is carefully integrated into the lesson program and the syllabus as a whole.

It is perhaps most appropriate to leave the last word to the students. The following

points were raised in responses to an anonymous survey of 20 students who were asked in the broadest of terms (It is good using computers to do grammar drills, because...; it is bad using computers to do grammar drills, because...) to provide some feedback on more than 6 months' use of computers for reinforcement of grammar covered in class and for compulsory preparation for a series of small class grammar tests forming part of the continuous assessment of the course.

Positive comments outweighed negative ones two to one. The negative comments concentrated on the inflexibility of the computer ("too bloody fussy!"), the fact that it can be unforgiving if you hit a wrong key at the wrong time, and that poor typing skills slow you down. Students also mentioned that it was difficult for them when the feedback provided was not adequate; it was hard on the eyes after a couple of hours; there was a problem if you have to do the work on campus but live a long way away; the computer can be slow at times (in checking long responses); and that more use of sound and opportunity to speak would be helpful.

The positive comments were more broad-ranging and are typified by the following:

- immediate feedback and correction
- easy to use
- much more practice than in a set text
- you learn a pattern
- work is individual but guided
- the designer has structured the work carefully
- the work is set out for the student
- it encourages, insists on accuracy
- it shows up weaknesses

- you are free to do the exercises you want
- you can do the exercises whenever it suits you, at your own pace, and spend as much time as you like
- no need for supervision
- there is a large base of questions, questions are varied but the pattern is consistent
- there is some fun involved
- it is good backup for home study
- you can make mistakes anonymously
- "There probably aren't many bad things, so long as we keep it up, because it's a good way to learn. It would be better if we were in France, but hey! we're not!"

APPENDIX 1

Foreign language software developed at the University of Wollongong

Grammar

French Adjectives
French Articles
French Comparison
French Imperfect & Passé Composé
French Verbs Passé Composé
French Verbs Present Tense
French Pronoun Objects
French Relative Pronouns
French Reported Speech

Italian Adjectives

Italian Articles
Italian Basic Expressions
Italian Numbers
Italian Passato Prossimo
Italian Present Tense Verbs
Italian Pronoun Objects

Notions and Utility

Bons Mots (French words and expressions in English)
Dis bien bonjour! (Greeting and leave-taking dialogue construction kit)
French Clockworks
French Date
French ID Kit
French Spelling
French VocabBuilder
Numbers (French, English, German, Spanish, Indonesian, Japanese)
Grid Games (French, German, Italian, Spanish)
Basic Expressions (French, German, Spanish, Japanese)
Pot-Pouri Quiz (French)
English Proverbs
French Key Words
French Roadsigns
French Weather Station
Read Your Way Around France
French Shopping: Requests and Quantities
French Proverbs

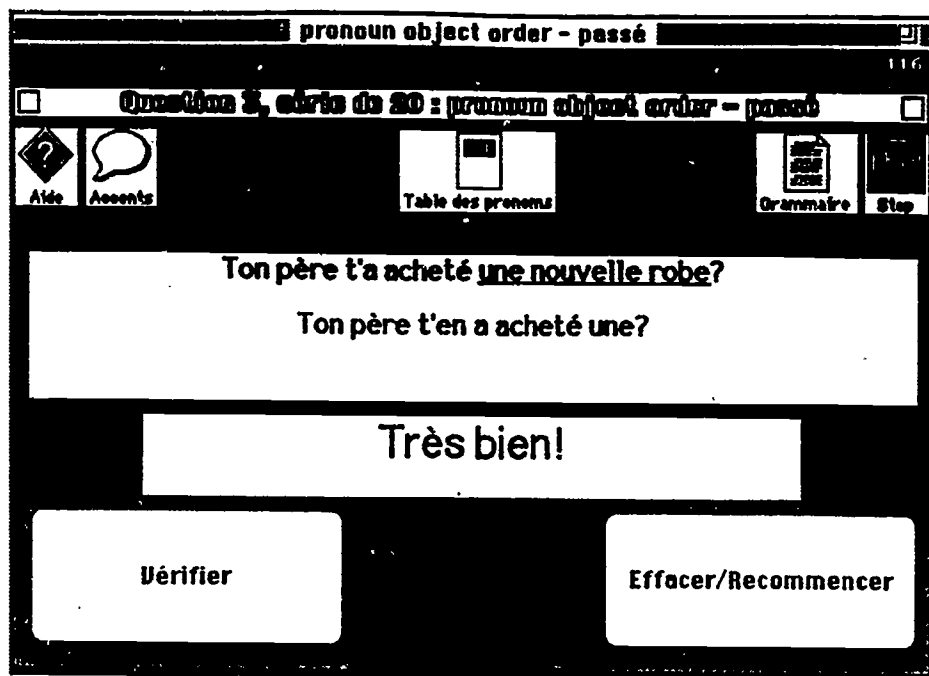


Fig. 1 Typical work screen from French Pronoun Object Form & Position exercise

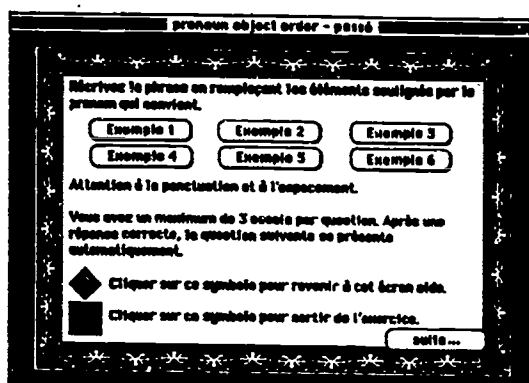


Fig 2a
Menu screen for
French Pronoun Object Order 'Help'

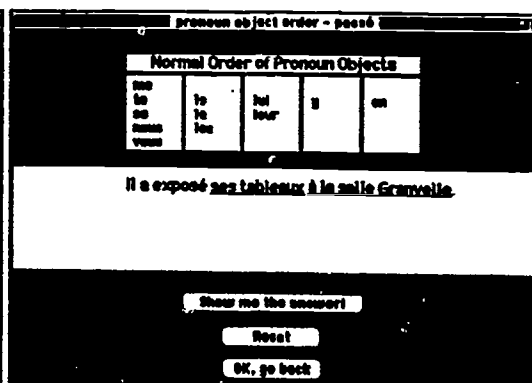


Fig 2b
Model sentence for Example 5
in 'starting position'

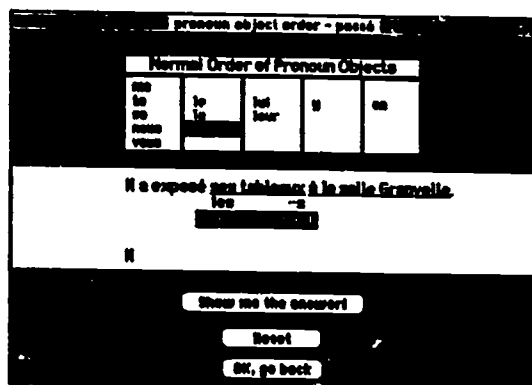


Fig 2c
Frozen intermediate stage of animated
rewriting of the model sentence, replacing
underlined portions by appropriate pronouns

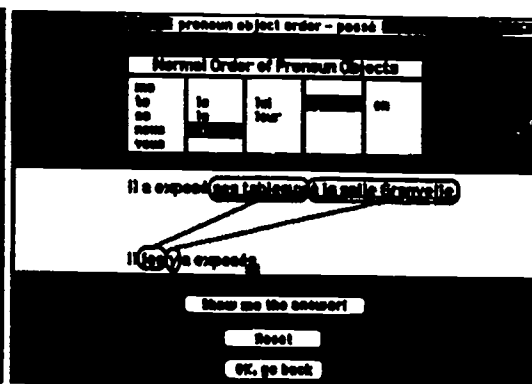


Fig 2d
Final stage of animated explanation
with 'hook-ups' allowing students to reflect on
the transformations

Fig. 2

One of the 'Help' tutorial sequences from the French Pronoun Object Exercise

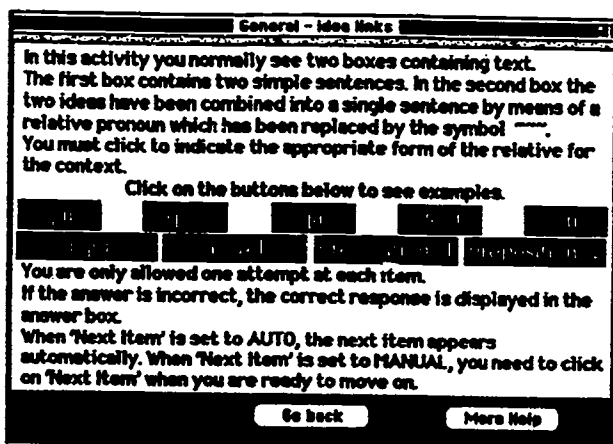


Fig 3a
Menu screen for French Relative Pronoun
Idea Link 'Help' screen

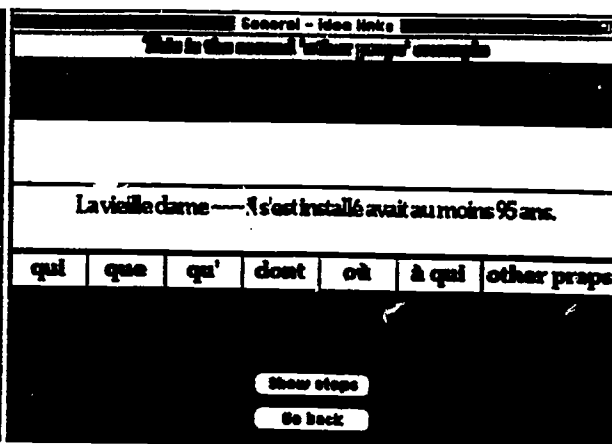


Fig 3b
Prepositions 2 example model sentence
in 'starting position'

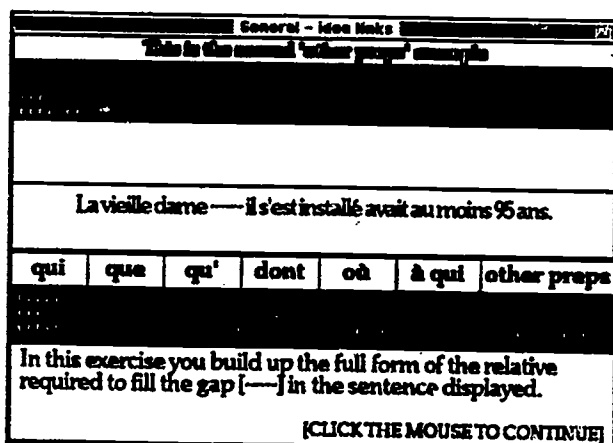


Fig 3c
Instruction 1

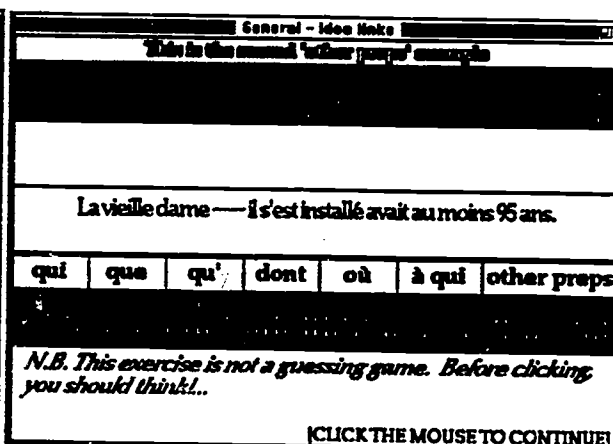


Fig 3d
Instruction 2

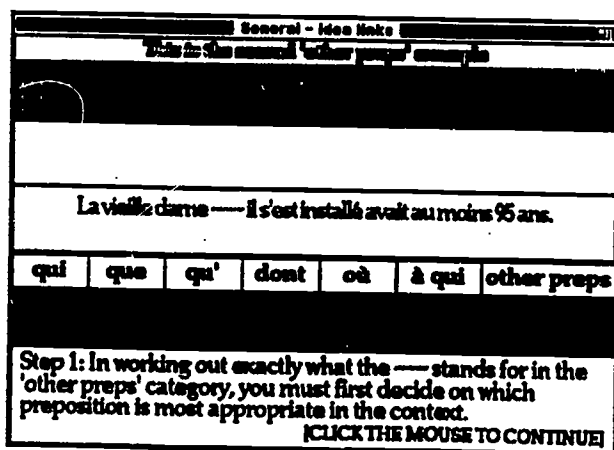


Fig 3e
Instruction 3

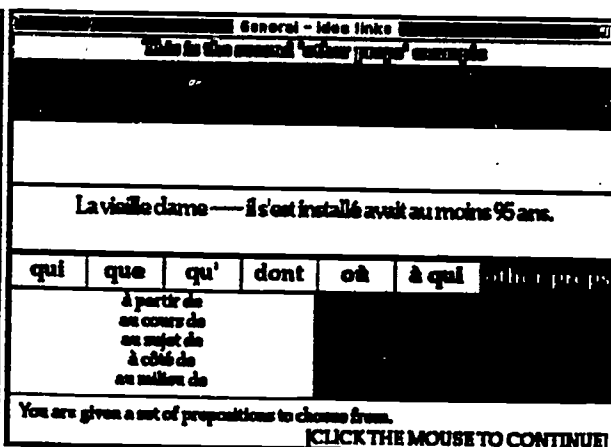


Fig 3f
Preposition menu

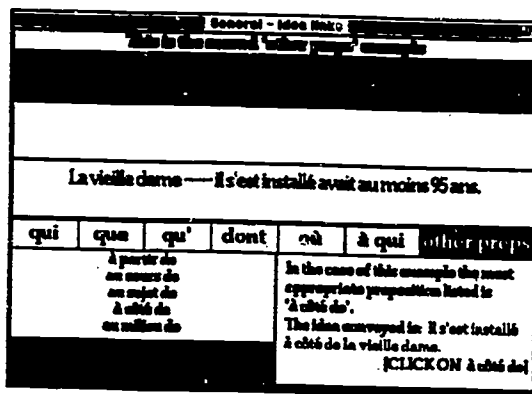


Fig 3g
Explanation of preposition choice

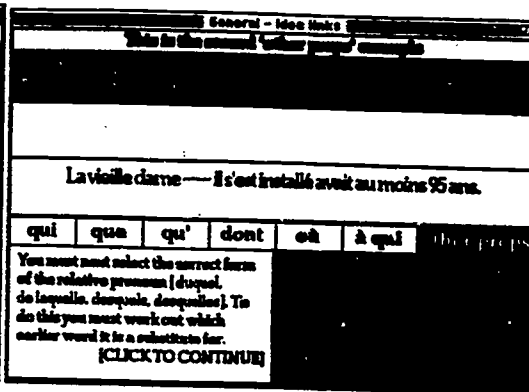


Fig 3h
Instruction 4

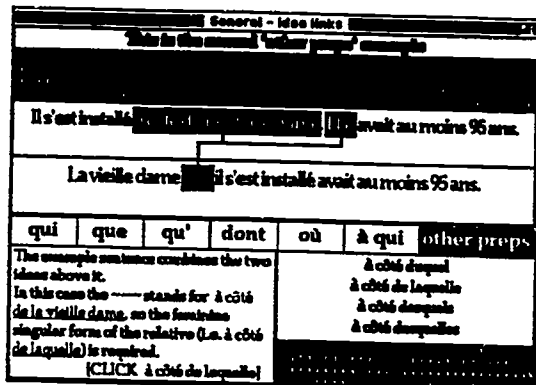


Fig 3i
Explanation of relative pronoun choice

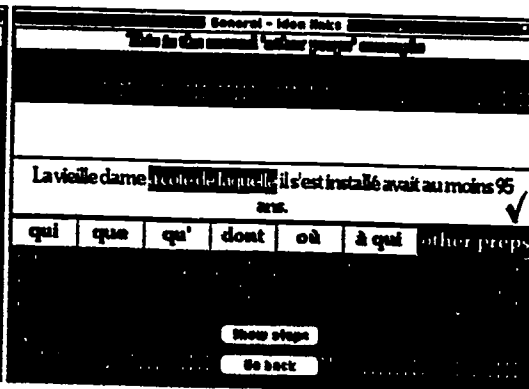


Fig 3j
Final stage of animated explanation

Fig 3
One of the 'Help' tutorial sequences from French Relative Pronoun Idea Links exercise

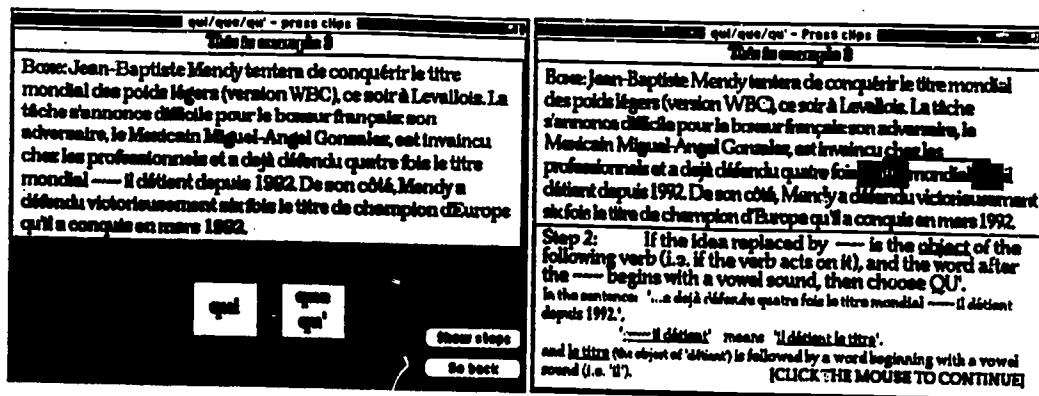


Fig 4
French Relative Pronouns Press Clips counterparts to Figs 3b and 3c (above)

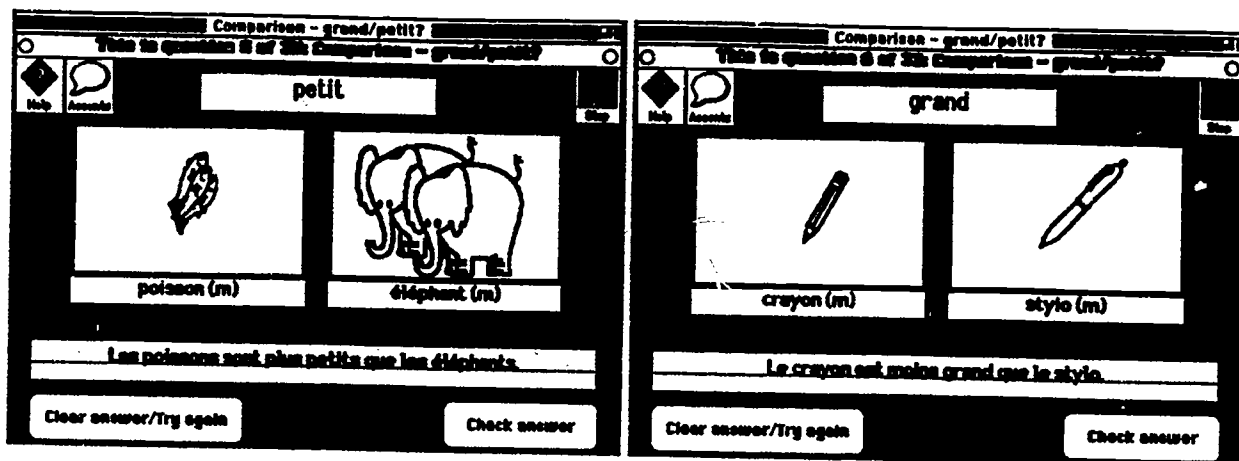


Fig. 5 Graphics as cues for generating comparative sentences

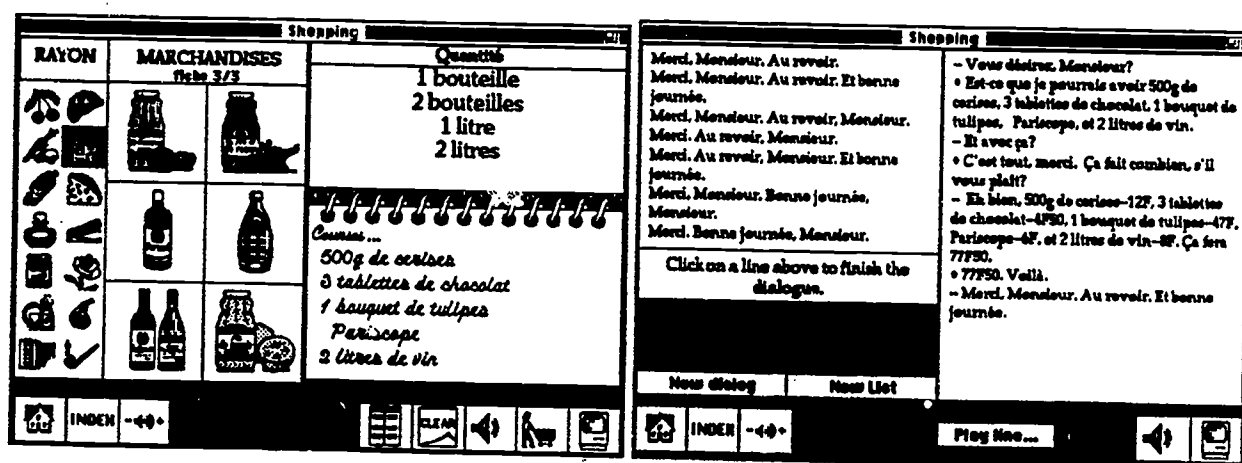


Fig. 6 Graphic cues underpinning manipulation of quantity expressions

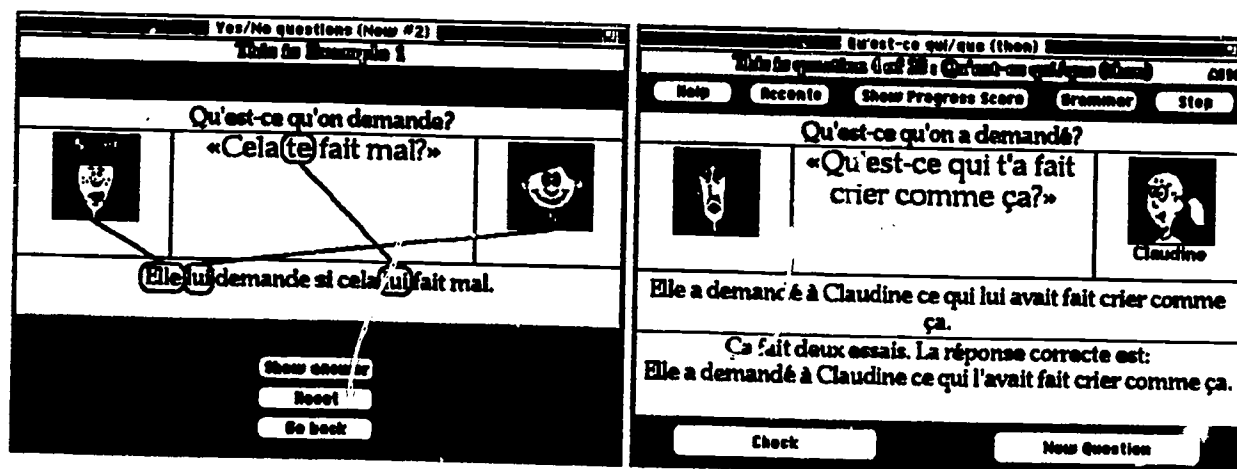


Fig. 7 Use of graphic cues for eliciting pronouns and for more lifelike treatment of reported speech

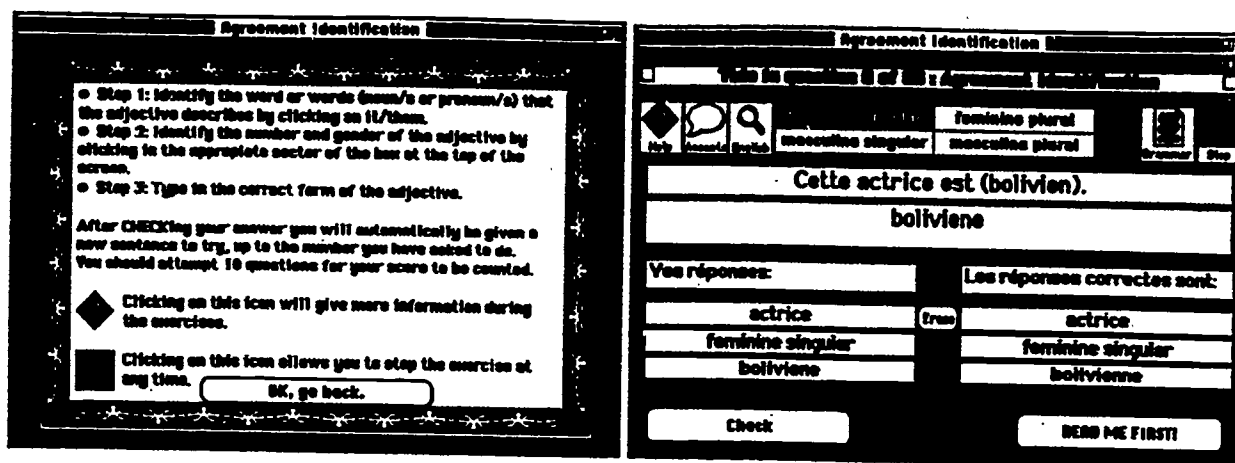


Fig. 8 Cognitive control in Adjective Agreement exercise

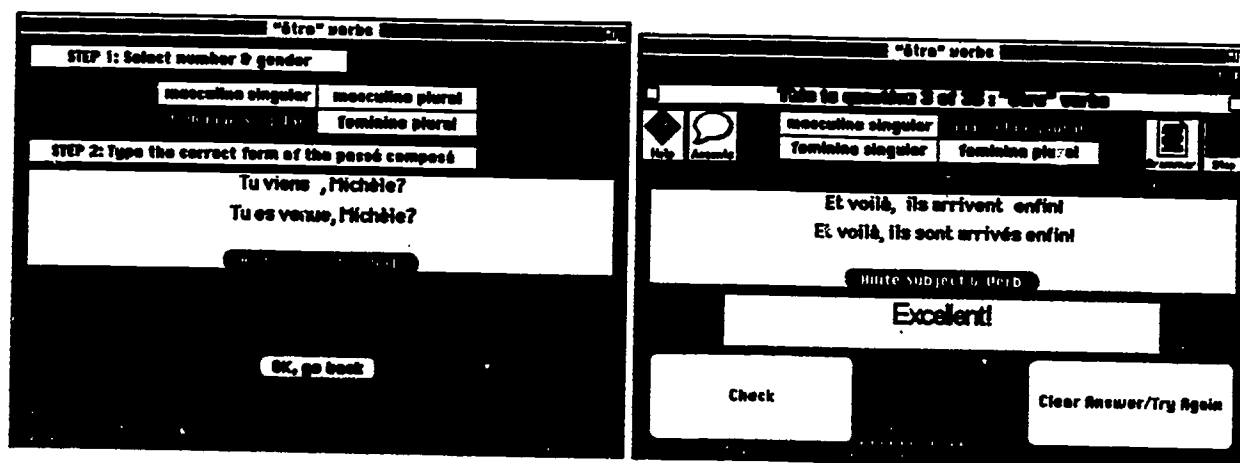


Fig. 9 Cognitive control with 'être' verbs in the passé composé